

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF THE CLAIMS:

1. (Cancelled)

2. (Currently Amended) The message processing apparatus according to claim [[1]]6, wherein each agent sends a notice to the process requestor associated with the agent as to the message in the message queue associated with the agent.

3. (Currently Amended) The message processing apparatus according to claim 6, further comprising:

list information creation means for, based on said process requestor search information, creating list information ~~on~~of process requestors ~~to~~from which a message generated ~~due to~~by said agent activating event;

a first message queue processing mechanism;

a second message queue processing mechanism; and

selection means for selecting either one of the first and second message queue processing mechanisms,

wherein:

the first message queue processing mechanism has insertion means for inserting said message into the message queues related to all the process requesters included in said list information; and

the second message queue processing mechanism has:

insertion and reading means for, of the process requesters included in said list information, selecting a plurality of unselected process requesters as the process requesters to be inserted and read, inserting said message into the message queues related to the process requesters to be inserted and read and reading the agents related to said process requesters from the persistent storage to the cache memory; and

repetitive instruction means for, in the case where the unselected process requester remains in said list information, waiting for termination of all the agents in operation and instructing said insertion and reading means to repeat the process.

4. (Previously Presented) The message processing apparatus according to claim 3,

wherein selection of said selection means is based on an instruction of an operator.

5. (Currently Amended) The message processing apparatus according to claim 3, wherein selection of said selection means ~~is~~ operates based on estimated number of the process requesters ~~to from~~ which the message generated ~~upon by~~ the agent activating event, operates based on estimated hit rate in the cache memory where the agents resides, said agents associated with the process requesters ~~to from~~ which the message generated ~~upon by~~ the agent activating event, ~~estimated work time,~~ in the case where said selection means selects the first message queue processing mechanism, the selection of said selection means operates based on estimated work time from acceptance of information by said acceptance means until obtaining the list information on the process requesters to which the message is applied and inserting the message into the message queues of all the agents, ~~estimated work time,~~ in the case where said selection means selects the second message queue processing mechanism, the selection of said selection

~~means operates based on estimated work time from acceptance of information by said acceptance~~
means until obtaining the list information on the process requesters to which the message is
applied and inserting the message into the message queues of all the agents, ~~the selection of said~~
~~selection means operates based on estimated time from determining use of the cache memory~~
~~associated with the agent if the agent in the cache memory is used until completing a process by~~
a determined agent, and/or ~~the selection of said selection means operates based on estimated time~~
~~from determining use of outside the cache memory associated with the agent if the agent outside~~
~~the cache memory is used until the completing the process the process is completed by the~~
determined agent.

6. (Currently Amended) A message processing apparatus comprising:

process requester search information management means for managing process requestor
search information for searching for an applicable process requestor ~~associated with of an agent~~
activating event;

acceptance means for accepting the agent activating event;

process requestor determination means for determining a process requestor ~~to from~~ which
a message generated ~~upon by~~ said agent activating event based on said process requestor search
information;

a plurality of agents associated with the process requesters, stored in a persistent storage,
readable from the persistent storage to a cache memory and abandonable from the cache
memory, each agent becoming operable when existing in the cache memory;

at least one sub-process priority determination means for determining process priority
about each message as sub-process priority based on a single standard of value;

compound process priority determination means for, when the total number of said sub-process priority determination means is two or more, determining compound process priority about each message based on the sub-process priority individually determined as to each message by each sub-process priority determination means, and when the total number of said sub-process priority determination means is one, determining as the compound process priority the sub-process priority determined by said one sub-process priority determination means as to each message; and

agent instruction means for rendering the message of the highest compound process priority among the messages held by each message queue as the message of the highest priority, and between the agents related to the message queues of which compound process priority of the message of the highest priority is the same, instructing the agent existing in the cache memory to operate in preference to the agent not existing therein[.].]

list information creation means for, based on said process requestor search information, creating list information of process requestors from which a message generated by said agent activating event;

insertion and reading means for, of the process requestors included in said list information, selecting a plurality of unselected process requestors as the process requestors to be inserted and read, inserting said message into the message queues related to the process requestors to be inserted and read and reading the agents related to said process requestors from the persistent storage to the cache memory, wherein said inserting and said reading are performed in parallel;

repetitive instruction means for, in the case where the unselected process requester remains in said list information, waiting for termination of all the agents in operation and instructing said insertion and reading means to repeat process;

a plurality of threads mutually operable in parallel, each thread detecting the process requesters to which the message generated due to said agent activating events based on said process requestor search information and inserting said message into the message queues related to the process requesters; and

allocation means for allocating to each thread the agent activating event to be processed by the thread,

wherein threads are allocated first to the agents having messages of low priorities.

7. (Currently Amended) The message processing apparatus according to claim 6, wherein said standard of value ~~may be~~ is related to one or more of: the contents of the message or ~~to the~~ process requesters to which the message is applied.

8. (Currently Amended) The message processing apparatus according to claim 7, wherein the ~~predetermined~~ standard of value related to the contents of the message includes the standard of value related to an emergency of the message.

9. (Currently Amended) The message processing apparatus according to claim 7, wherein the standard of value related to the process requesters to which the message is applied includes the standard of value related to a rating of the process requesters.

10. (Previously Presented) The message processing apparatus according to claim 6, wherein, when there are a plurality of messages held by the message queue associated with the agent initiated by said agent instruction means, the agent continuously processes all those messages or the messages of which compound process priority is within a predetermined value in descending rank.

11. (Previously Presented) The message processing apparatus according to claim 6, wherein:

there is agent management means including said sub-process priority determination means and said compound process priority determination means;

said agent management means has existence detection means for detecting whether or not each agent exists in the persistent storage, grouping information management means for grouping the agents and managing grouping information based on results of the existence detection means and the compound process priority of each agent, and update instruction means for instructing the grouping information management means to update the grouping information; and

said agent instruction means instructs the agents to operate in order based on the grouping information of said agent management means.

12. (Currently Amended) The message processing apparatus according to claim 6, further comprising:

acceptance order information management means for managing acceptance order information on the agent activating events accepted by said acceptance means;

~~a plurality of threads mutually operable in parallel, each thread detecting the process requesters to which the message generated due to said agent activating events based on said process requester search information and inserting said message into the message queues related to the process requesters;~~

~~allocation means for allocating to each thread the agent activating event to be processed by the thread;~~

proceeding information management means for managing proceeding information of the thread associated with each agent activating event accepted by said acceptance means;

determination means for, associated with the agent activating event which indicates proceeding information is information on thread termination (hereafter, referred to as a "determined agent activating event"), determining whether or not, of the agent activating events accepted by said acceptance means prior to the determined agent activating event, there is any agent activating event which indicates a thread is unfinished; and

agent control means for controlling the agent associated with the message generated upon the determined agent activating event determined as that there is an agent activating event which indicates a thread is unfinished.

13. (Currently Amended) The message processing apparatus according to claim 12, wherein said agent control means for allowing the agent associated with the message generated upon the determined agent activating event determined as that there is no agent activating event which indicates a thread is unfinished.

14. (Currently Amended) The message processing apparatus according to claim 13, wherein said determination means for, in the case where the agent activating event immediately following the agent activating event determined as that there is no agent activating event which indicates a thread is unfinished, in acceptance order is already determined as that there is an agent activating event which indicates a thread is unfinished, changing a determination result from that there is an agent activating event which indicates a thread is unfinished to that there is no agent activating event which indicates a thread is unfinished.

15. (Currently Amended) The message processing apparatus according to claim 14, wherein said agent for, in the case of processing the message queue in which the messages generated due to a plurality of agent activating events ~~of which~~ whose determination result by said determination means is that there is no agent activating event which indicates a thread is unfinished, continuously processing the plurality of continuous messages.

16. (Cancelled)

17. (Currently Amended) The message processing method according to claim ~~[[16]]~~21, wherein each agent sends a notice to the process requestor associated with the agent as to the message in the message queue associated with the agent.

18. (Currently Amended) The message processing method according to claim 21, further comprising:

a list information creation step of, based on said process requester search information, creating list information ~~on~~of process requestors ~~to~~from which a message generated ~~due to~~by said agent activating event;

a first message queue processing step;

a second message queue processing step; and

a selection step of selecting either one of the first and second message queue processing steps;

wherein:

the first message queue processing step has an insertion step of inserting said message into the message queues related to all the process requestors included in said list information; and

the second message queue processing step has:

an insertion and reading step of, of the process requestors included in said list information, selecting a plurality of unselected process requestors as the process requestors to be inserted and read, inserting said message into the message queues related to the process requestors to be inserted and read and reading the agents related to said process requestors from the persistent storage to the cache memory; and

a repetitive instruction step of, in the case where the unselected process requester remains in said list information, waiting for termination of all the agents in operation and instructing said insertion and reading step to be repeated.

19. (Previously Presented) The message processing method according to claim 18, wherein the selection in said selection step is based on an instruction of an operator.

20. (Currently Amended) The message processing method according to claim 18, wherein the selection in said selection step ~~is operates~~ based on estimated number of the process requestors ~~to~~ from which the message generated ~~upon by~~ the agent activating event, operates based on estimated hit rate in the cache memory where the agents resides, said agents associated with the process requestors ~~to~~ from which the message generated ~~upon by~~ the agent activating event, ~~estimated work time~~, in the case where the process is allocated in the first message queue processing step, the selection in said selection step operates based on estimated work time from acceptance of information in said acceptance step until obtaining the list information on the process requestors to which the message is applied and inserting the message into the message queues of all the agents, ~~estimated work time~~, in the case where the process is allocated in the second message queue processing step, the selection in said selection step operates based on estimated work time from acceptance of information in said acceptance step until obtaining the list information on the process requestors to which the message is applied and inserting the message into the message queues of all the agents, the selection in said selection step operates based on estimated time from determining use of the cache memory associated with the agent if the agent in the cache memory is used until completion of completing a process by a determined agent, and/or the selection in said selection step operates based on estimated time from determining use of outside the cache memory associated with the agent if the agent outside the cache memory is used until the completion of the process the process is completed by the determined agent.

21. (Currently Amended) A message processing method comprising:

a process requester search information management step of managing process requestor search information for searching for an applicable process requester ~~associated with~~ of an agent activating event;

an acceptance step of accepting the agent activating event;

a process requestor determination step of determining a process requestor ~~to~~ from which a message generated ~~upon~~ by said agent activating event based on said process requestor search information;

an agent setting step of setting a plurality of agents, the agents being associated with the process requesters, stored in a persistent storage, each agent being readable from the persistent storage to a cache memory and abandonable from the cache memory, and each agent operating only when existing in the cache memory to be able to process the message in a message queue corresponding to the agent;

at least one sub-process priority determination step of determining process priority about each message as sub-process priority based on a single standard of value;

a compound process priority determination step of, when the total number of said sub-process priority determination steps is two or more, determining compound process priority about each message based on the sub-process priority individually determined as to each message in each sub-process priority determination step, and when the total number of said sub-process priority determination steps is one, determining as the compound process priority the sub-process priority determined in said one sub-process priority determination step as to each message; and

an agent instruction step of rendering the message of the highest compound process priority among the messages held by each message queue as the message of the highest priority,

and between the agents related to the message queues of which compound process priority of the message of the highest priority is the same, instructing the agent existing in the cache memory to operate in preference to the agent not existing therein;

a list information creation step of, based on said process requestor search information, creating list information of process requesters from which a message generated by said agent activating event;

an insertion and reading step of, of the process requestors included in said list information, selecting a plurality of unselected process requesters as the process requesters to be inserted and read, inserting said message into the message queues related to the process requestors to be inserted and read, and reading the agents related to said process requestors from the persistent storage to the cache memory, wherein said inserting and said reading are performed in parallel;

a repetitive instruction step of, in the case where the unselected process requester remains in said list information, waiting for termination of all the agents in operation and instructing said insertion and reading step to be repeated

a thread setting step of setting a plurality of threads, the threads being mutually operable in parallel, detecting the process requestors to which the message generated due to the agent activating event based on said process requestor search information and inserting said message into the message queues related to the process requestors;

an allocation step of allocating to each thread the agent activating event to be processed by the thread,

wherein the threads are allocated first to the agents having messages of low priorities.

22. (Currently Amended) The message processing method according to claim 21, wherein said standard of value ~~may be~~ is related to one or more of the contents of the message or ~~to the~~ process requestors to which the message is applied.

23. (Currently Amended) The message processing method according to claim 22, wherein the ~~predetermined~~ standard of value related to the contents of the message includes the standard of value related to an emergency of the message.

24. (Currently Amended) The message processing method according to claim 22, wherein the standard of value related to the process requestors to which the message is applied includes the standard of value related to a rating of the process requesters.

25. (Previously Presented) The message processing method according to claim 21, wherein, when there are a plurality of messages held by the message queue associated with the agent initiated in said agent instruction step, the agent continuously processes all those messages or the messages of which compound process priority is within a predetermined value in descending rank.

26. (Previously Presented) The message processing method according to claim 21, further comprising:

an agent management step including said sub-process priority determination step and said compound process priority determination step;

said agent management step having an existence detection step for detecting whether or not each agent exists in the persistent storage, and grouping information management step of grouping the agents, managing grouping information and updating the grouping information as

appropriate based on results of the existence detection step and the compound process priority of each agent; and

said agent instruction step for instructing the agents to operate in order based on the grouping information in said agent management step.

27. (Currently Amended) The message processing method according to claim 21, further comprising:

an acceptance order information management step of managing acceptance order information on the agent activating events accepted by said acceptance step;

~~a thread setting step of setting a plurality of threads, the threads being mutually operable in parallel, detecting the process requestors to which the message generated due to the agent activating event based on said process requestor search information and inserting said message into the message queues related to the process requestors;~~

~~an allocation step of allocating to each thread the agent activating event to be processed by the thread;~~

a proceeding information management step of managing proceeding information of each thread associated with each agent activating event accepted by said acceptance step;

a determination step of, associated with the agent activating event which indicates proceeding information is information on thread termination (hereafter, referred to as a "determined agent activating event"), determining whether or not, of the agent activating events accepted in said acceptance step prior to the determined agent activating event, there is any agent activating event of which thread process is unfinished; and

an agent control step of controlling the agent associated with the message generated upon the determined agent activating event determined as that there is an agent activating event which indicates a thread is unfinished.

28. (Currently Amended) The message processing method according to claim 27, wherein said agent control step of allowing the agent associated with the message generated upon the determined agent activating event determined as that there is no agent activating event which indicates a thread is unfinished.

29. (Currently Amended) The message processing method according to claim 27, wherein said determination step of, in the case where the agent activating event immediately following the agent activating event determined ~~as~~ that there is no agent activating event which indicates a thread is unfinished, in acceptance order is already determined ~~as~~ that there is an agent activating event which indicates a thread is unfinished, changing the determination result from that there is an agent activating event which indicates a thread is unfinished to that there is no agent activating event which indicates a thread is unfinished.

30. (Currently Amended) The message processing method according to claim 29, wherein said agent setting step of, in the case of causing the agent to process the message queue in which the messages generated due to a plurality of agent activating events ~~of which~~ whose determination result by said determination step is that there is no agent activating event which indicates a thread is unfinished, setting said agent to continuously process the plurality of continuous messages.

31-33. (Canceled)

34. (Original) A computer program product comprising a computer usable medium having computer readable program code means embodied therein for causing message processing, the computer readable program code means in said computer program product comprising computer readable program code means for causing a computer to effect the functions of claim 6.

35-41. (Canceled)

42. (Original) A program storage device readable by machine, tangibly embodying a program of instructions executable by the machine to perform method steps for message processing, said method steps comprising the steps of claim 21.

43. (Canceled)

44. (Previously Presented) The message processing apparatus according to claim 6, further comprising:

an agent server for processing said plurality of agents asynchronously, having said message queue of said each agent, managing said cache memory, and allocating threads to said agents on said cache memory.

45. (Currently Amended) A message processing method according to claim 21, further comprising:

~~an agent server step of~~ providing an agent server to process said plurality of agents asynchronously, to have said message queue of said each agent, to manage said cache memory, and to allocate threads to said agents on said cache memory.